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1.4.3 Sampling, Sample Storage, and Pretreatment; 1.4.4 Measurements with Electrochemical Sensors; 1.5 Concluding Remarks; References; Chapter 2: Soil  
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2.5 Application of Proximal Soil Sensors 2.5.1 Voltammetric Methods; 2.5.2 Conductometric Methods: Soil ECa; 2.5.2.1 Soil Conductivity Sensors; 2.5.3 Potentiometric Methods: Ion-Selective Electrodes; 2.5.3.1 Issues in ISE/ISFET Application; 2.5.3.2 Application: Soil Nutrient Sensing; 2.5.3.3 Nitrate, Potassium, and Phosphate Membranes and Electrodes; 2.5.3.4 Laboratory Prototype Systems for Soil Nutrient Sensing; 2.5.3.5 Field-Mobile Soil Nutrient Sensors; 2.6 Future Outlook and Considerations; 2.6.1 Considerations in Soil Nutrient Sensing; 2.6.1.1 Sensor Fusion; 2.6.1.2 Sensor Calibration 2.6.1.3 Integration with Fertilizer Application Equipment References;  
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## Sommario/riassunto

Electrochemical sensors represent the oldest type of chemical sensors and are widely present in chemical laboratories, industries, healthcare and in many aspects of our daily life. During the past few decades biosensors mimicking biological receptors for the sake of analytical assessment have emerged as an extremely important and fruitful field in fundamental and applied electroanalytical chemistry. Research and routine analysis in environmental sciences have shown that electrochemical sensors and biosensors may supply useful information for solving problems from the quite general to the highly specific, dealing with environmental pollution or many other questions in connection with (bio)geochemical cycles or fundamental environmental chemical processes. Environmental analytical chemistry is a multidisciplinary field requiring the cooperation of chemists, biochemists, physicists, engineers and many other specialists, a collaboration which defines and guarantees the development and applicability of robust and highly sensitive sensors for chemical analysis and environmental monitoring. The aim of this book is to give

an overview of the role of electrochemical sensors in environmental chemical analysis and on their operating principles. It provides detailed information on the applicability of such sensors to the determination of all the different substances of environmental importance. It is designed on one hand as a textbook for students and teachers, and, on the other, as a manual for researchers and applied scientists and engineers who are fully or marginally confronted with problems in context with environmental chemistry. Due to its multidisciplinary character the book synthesizes various viewpoints of different sciences and addresses chemists, physicists, pharmacists, medical doctors, engineers and in fact all who are interested, professionally or non-professionally, in the chemistry of our environment.

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